12-30-99

jc583 U.S. PTO 12/28/99

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PTO/SB/05 (4/98)
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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1 53(b))

| | |
|---|---|
| Attorney Docket No. | 678-418 (P8879) |
| First Inventor or Application Identifier | Ki-Hwan Kim |
| Title | METHOD FOR STORING AND REPRODUC |
| Express Mail Label No. | EL393560697US |

jc525 U.S. PTO 09/474,185 12/28/99

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231

1. [X] * Fee Transmittal Form *(e.g., PTO/SB/17)* (Submit an original and a duplicate for fee processing)
2. [X] Specification [Total Pages 13] (preferred arrangement set forth below)
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
3. [X] Drawing(s) *(35 U.S.C. 113)* [Total Sheets 4]
4. Oath or Declaration [Total Pages ]
   a. [ ] Newly executed (original or copy)
   b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 16 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28)*

5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [ ] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [ ] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
15. [ ] Other: .....

16. **If a CONTINUING APPLICATION,** *check appropriate box, and supply the requisite information below and in a preliminary amendment:*

[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No: _____/_____

*Prior application information:* Examiner _____ *Group / Art Unit:* _____

**For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied** under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by **reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.**

## 17. CORRESPONDENCE ADDRESS

[ ] *Customer Number or Bar Code Label* *(Insert Customer No or Attach bar code label here)* or [X] *Correspondence address below*

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| | | | |
|---|---|---|---|
| Name (Print/Type) | Paul J. Farrell | Registration No. (Attorney/Agent) | 33,494 |
| Signature | Paul J. Farrell | Date | 12/28/99 |

**PATENT**
Atty. Docket No. 678-418 (P8879)

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Assistant Commissioner
for Patents
Washington, D.C. 20231

## UTILITY APPLICATION FEE TRANSMITTAL

Sir:

Transmitted herewith for filing is the patent application of

Inventor(s): Ki-Hwan Kim

For: METHOD FOR STORING AND REPRODUCING A VOICE MESSAGE IN A MOBILE TELEPHONE

Enclosed are:

[X] 9 page(s) of specification

[X] 1 page(s) of Abstract

[X] 3 page(s) of claims

[X] 4 sheets of drawings [X] formal [] informal

[] ___ page(s) of Declaration and Power of Attorney

[] An Assignment of the invention to _____

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**CERTIFICATION UNDER 37 C.F.R. § 1.10**

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date December 28, 1999 in an envelope as "Express Mail Post Office to Addressee" Mail Label Number EL393560697US addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Daniel E. Tierney
(Type or print name of person mailing paper)

(Signature of person mailing paper)

[] This application claims the benefit under 35 U.S.C. §119(e) of U.S. Provisional Application(s) No(s).:

| APPLICATION NO(S).: | FILING DATE |
|---|---|
| __/_____ | _____ |
| __/_____ | _____ |

[X] Certified copy of applications

| Country | Appln. No. | Filed |
|---|---|---|
| Korea | 60744 | December 30, 1998 |

from which priority under Title 35 United States Code, § 119 is claimed

[] is enclosed.

[X] will follow.

## CALCULATION OF UTILITY APPLICATION FEE

| For | Number Filed | Number Extra | Rate | Basic Fee $760.00 |
|---|---|---|---|---|
| TOTAL CLAIMS | 7 | 0 | x 18 = | $0 |
| INDEPENDENT CLAIMS | 2 | 0 | x 78 = | $0 |
| [] Multiple Dep. Claim | 0 | | 260 | $0 |
| | | | | TOTAL$760.00 |

[] Verified Statement of "Small Entity" Status Under 37 C.F.R. § 1.27. Reduced fees under 37 C.F.R. § 1.9(f) (50% of total) paid herewith $.

*Includes all independent and single dependent claims and all claims referred to in multiple claims. See 37 C.F.R. § 1.75(c).

[X] The amount of $40.00 for recording the attached Assignment is enclosed as a separate check.

[X] Two checks in the amount of $760.00 & $40.00 to cover the [X] recording, [X] filing fee(s) are attached.

[ ] Charge fee to Deposit Account No. 04-1121. Order No. _____
TWO (2) COPIES OF THIS SHEET ARE ENCLOSED.

[X] Please charge any deficiency as well as any other fee(s) which may become due under 37 C.F.R. § 1.16 and 1.17, at any time during the pendency of this application, or credit any overpayment of such fee(s) to Deposit Account No. 04-1121. Also, in the event any extensions of time for responding are required for the pending application(s), please treat this paper as a petition to extend the time as required and charge Deposit Account No. 04-1121 therefor. TWO (2) COPIES OF THIS SHEET ARE ENCLOSED.

Date: December 28, 1999

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# METHOD FOR STORING AND REPRODUCING A VOICE MESSAGE IN A MOBILE TELEPHONE

## PRIORITY

This application claims priority to an application entitled "Method for Storing and Reproducing Voice Message in Mobile Telephone" filed in the Korean Industrial Property Office on December 30, 1998 and assigned Serial No. 98-60744, the contents of which are hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates generally to a method for managing a voice message in a mobile telephone, and in particular, to a method for storing a voice message in a memory and reproducing the voice message stored in the memory.

### 2. Description of the Related Art

The voice message function currently adopted in mobile telephones has several limitations in storing a voice message in a memory. For example, in the Samsung SDH-600 or SDH-800, the total length of all voice messages is limited to 2 minutes and the number of the voice messages is limited to 4, so that each voice message is 30 seconds in length. Therefore, the user must consider all these limitations when storing a voice message, which is annoying.

In addition, when the user desires to listen to a certain voice message

stored in the memory, the user produces the intended voice message by selecting one of the labels associated with the stored voice messages, displayed on the display of the mobile telephone. However, it is difficult to accurately select a desired voice message using only the labels.

## SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a method for minimizing the limitations on a user when storing a voice message.

It is another object of the present invention to provide a method for enabling the user to determine whether to reproduce the whole voice message by reproducing some of the voice message.

In accordance with one aspect of the present invention, there is provided a method for storing a voice message in a mobile telephone having a memory for storing a voice message. The method comprises determining whether a voice message store mode is set by a user; calculating, if the voice message store mode is set, the remaining memory capacity; if the remaining memory capacity is sufficient to store the voice message, starting storing a voice message in the memory while simultaneously displaying the length of the stored voice message; after a predetermined time interval, calculating the remaining memory capacity again, and updating the displayed length of the stored amount of the voice message; if the remaining memory capacity is sufficient to store the voice message, determining whether storing the voice message is completed, and, if storing the voice message is not completed, returning to the third step; if the remaining memory capacity is insufficient, displaying a memory full message;

and upon completion of storing the voice message, calculating storage-related information and storing the storage-related information in the memory as voice message storage information for the stored voice message.

In accordance with another aspect of the present invention, there is provided a method for reproducing a voice message in a mobile telephone having a memory for storing voice message storage-related information. The method comprises determining whether a voice message reproduce mode is set by a user; if the voice message reproduce mode is set, accessing the memory to find the last stored voice message by consulting the stored times of respective voice messages; reproducing the found voice message while simultaneously displaying the remaining time left in the voice message; after a predetermined time interval, updating the remaining time left being displayed, determining if a scroll key is input, and, if the scroll key is input, finding the next voice message and returning to the third step to reproduce the next voice message; if the scroll key is not input, determining whether the reproduction is complete; if the reproduction is complete, determining if the user wishes to hear the message again; if the user wishes to hear it again, returning to the third step, and, if not, determining whether it was the last message; and if it was the last message, ending the sequence, and, if not, finding the next phone message and returning to the third step.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a block diagram illustrating a mobile telephone to which the present invention is applicable;

FIG. 2 is a diagram illustrating a map of a voice memory according to the preferred embodiment of the present invention;

FIG. 3 is a flow chart illustrating a procedure for storing a voice message according to the preferred embodiment of the present invention; and

FIG. 4 is a flow chart illustrating a procedure for reproducing a voice message according to the preferred embodiment of the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will be described herein below with reference to the accompanying drawings. In the following description, well-known functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

FIG. 1 shows a block diagram of a mobile telephone to which the present invention is applied. Referring to FIG. 1, a central processing unit (CPU) 10 calculates a remaining memory capacity, and controls the storing and reproducing of a voice message. A first memory 20, preferably a ROM (Read Only Memory), stores a control program and initial service data of the mobile telephone. A second memory 30, preferably a RAM (Random Access Memory), temporarily stores various data generated during operation of the mobile telephone. A third memory 40, a voice memory, stores various data required to manage the storage of voice messages. A baseband processor 50 processes a baseband signal. A radio transceiver 60 connected between the baseband processor 50 and an antenna, demodulates a radio signal received via the

antenna and modulates a radio signal to be transmitted via the antenna. A key input unit 70 has various keys including those for the storing and reproducing of voice messages, such as a scroll key for proceeding to the next voice message. A display 80, an LCD (Liquid Crystal Display), displays the storing or reproducing state of the voice message, under the control of the CPU 10. A vocoder 90 processes a voice signal input from a microphone (MIC) 100 to provide the processed voice signal to the baseband processor 50, and provides a baseband signal from the baseband processor 50 to a speaker (SPK) 110. More specifically, the vocoder 90 converts an analog voice signal input from the microphone 100 to a digital PCM (Pulse Code Modulation) signal using an internal analog-to-digital converter, and then compresses the PCM signal into packet data. Preferably, the vocoder 90 uses 8Kbps QCELP (Qualcomm Code Excited Linear Predictive coding) for a CDMA (Code Division Multiple Access) phone, or uses RPE-LTP (Regular Pulse Excitation with Long Term Prediction) for a GSM (Global System for Mobile communication) phone. The vocoder 90 provides the CPU 10 with the output packet data. The CPU 10 provides the third memory with the address where the output packet data is stored and the packet data output from the third memory is transmitted to the vocoder 90. Upon receipt of a reproduce command from the user, the CPU 10 reads the packet data corresponding to the address in the third memory 40, converts the read packet data to a PCM signal, and provides the converted PCM signal to a digital-to-analog converter in the vocoder 90. The digital-to-analog converter converts the input PCM signal to an analog signal, and then outputs it as an audible sound through the speaker 110.

FIG. 2 shows a map of the voice memory 40 of FIG. 1, according to the preferred embodiment of the present invention. A nonvolatile memory, such as

an EEPROM (Electrically Erasable and Programmable Read Only Memory), can be used for the third memory 40. The third memory 40 includes several fields for storing voice data, the stored time of the voice message, the length of the stored voice message, the memory capacity used for storing the voice message, and the remaining memory capacity. The stored time of the message is the time at which the message was stored, and it is used to indicate the order of the voice messages.

FIG. 3 shows a procedure for storing a voice message according to the preferred embodiment of the present invention. The CPU 10 scans the key input unit 70 in step 3a, to determine whether the phone has been set to the voice message store mode by the user. If the voice message store mode is set, the CPU 10 calculates a remaining memory capacity by subtracting the used memory capacity from the total memory capacity, in step 3b.

In step 3c, the CPU 10 analyzes the calculation results to determine whether there is enough remaining memory capacity to store the voice message. If it is determined that the remaining memory capacity is insufficient to store the voice message, the CPU 10 displays a "memory-full" message on the display 80, in step 3l.

However, if it is determined that the remaining memory capacity is sufficient to store the voice message, the CPU 10 starts storing the voice message in the third memory 40 while simultaneously displaying the length of the stored voice message on the display 80, in step 3d. In step 3e, the CPU 10 determines whether a predetermined time period, such as a second, has elapsed or not. When the predetermined time period has elapsed, the CPU 10 calculates

the remaining memory capacity and updates the length of the stored voice message, being displayed on the display 80, in step 3f.

In step 3g, the CPU 10 analyzes the calculation results to determine whether there is enough remaining memory capacity. If the remaining memory capacity is insufficient, the CPU 10 displays a "memory-full" message on the display 80 in step 3k. Here, the length of the voice message is previously determined, for example, as 10 seconds. To increase the storing and reproducing efficiency, it is necessary to allocate a memory capacity of 10 seconds even when storing a voice message of 1 second. Therefore, when the remaining memory capacity is less than 10 seconds, it is necessary to inform the user of the memory-full state. Then, the user can either delete a previously stored message or quit storing the present voice message.

However, if the remaining memory capacity is sufficient, the CPU 10 determines in step 3h whether the voice message is completely stored. There are many ways the CPU 10 might determine if the phone message is complete. For example, the CPU 10 may determine that the phone message is complete when either the user presses a key indicating the end of the message or a predetermined time limit for message length runs out. If the voice message is not completed, the CPU 10 returns to the step 3e. However, if storing the voice message is complete, the CPU 10 calculates storage-related information in step 3i. The storage-related information includes the stored time of the voice message, the length of the stored voice message, and the memory capacity used for storing the voice message. Thereafter, the CPU 10 stores the calculated results in the third memory 40 as voice message storage information in step 3j.

FIG. 4 shows a procedure for reproducing a voice message according to

the preferred embodiment of the present invention. The CPU 10 scans the key input unit 70 in step 4a, to determine whether the phone has been set to the voice message reproduce mode by the user. If the voice message reproduce mode is set, the CPU 10 accesses the third memory 40 to detect the last stored voice message by consulting the stored time of the respective voice messages, in step 4b. Thereafter, in step 4c, the CPU 10 starts reproducing the detected last voice message and simultaneously displays the remaining time left on the display 80. Subsequently, the CPU 10 determines in step 4d whether a predetermined time period has elapsed or not. When the predetermined time period has elapsed, the CPU 10 updates the remaining time left being displayed on the display 80, in step 4e. For example, when the length of the stored voice message is 30 seconds, the CPU 10 displays the remaining time left on a count-down basis, such as '30 seconds' → '29 seconds' → '28 seconds' ···· → '0 second'.

Thereafter, in step 4f, the CPU 10 scans the key input unit 70 to determine whether a scroll key is input or not. When the scroll key is input (or pressed), the CPU 10 accesses the third memory 40 to find the next voice message in step 4g, and returns to step 4c to reproduce the newly found voice message while displaying the remaining time left.

However, upon failure to detect the scroll key input in step 4f, the CPU 10 determines in step 4h whether reproduction of the voice message is completed or not. If reproduction is completed, the CPU 10 scans the key input unit 70 in step 4i to determine whether the user intends to listen to the voice message again. If the user intends to listen to the voice message again, the CPU 10 returns to step 4c. Otherwise, the CPU 10 determines in step 4j whether the

reproduced voice message is the last voice message in memory. If the reproduced voice message is the last voice message, the CPU 10 ends the procedure. Otherwise, the CPU 10 proceeds to step 4g to find the next voice message stored in the third memory 40.

This method can also be used when deleting the voice messages.

In this manner, the user can store the increased number of voice messages without the various limitations in the prior art. In addition, when reproducing the voice messages, it is possible to detect a desired voice message more rapidly, without the need for text labels.

While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

**WHAT IS CLAIMED IS:**

1. A method for storing a voice message in a mobile telephone having a memory for storing a voice message, comprising the steps of:

(a) determining whether a voice message store mode is set by a user;

(b) calculating, when the voice message store mode is set, a remaining memory capacity, and starting storing a voice message in the memory while simultaneously displaying a length of the stored voice message, if the remaining memory capacity is sufficient to store the voice message;

(c) after a predetermined time interval, re-calculating the remaining memory capacity, and updating the displayed length of the stored voice message;

(d) determining whether storing the voice message is completed, if the remaining memory capacity is sufficient to store the voice message, and returning to the step (c) if storing the voice message is not completed; and

(e) upon completion of storing the voice message, calculating storage-related information and storing the storage-related information in the memory as voice message storage information for the stored voice message.

2. The method as claimed in claim 1, wherein the storage-related information includes a stored time of the voice message, a length of the stored voice message, and a memory capacity used for storing the voice message.

3. The method as claimed in claim 1, further comprising the step of displaying a memory-full message when the remaining memory capacity calculated in the step (b) is not sufficient to store the voice message.

4. The method as claimed in claim 1, further comprising the step of

displaying a memory-full message when the remaining memory capacity calculated in the step (c) is not sufficient to store the voice message.

5. A method for reproducing a voice message in a mobile telephone having a memory for storing a voice message and storage-related information, the method comprising the steps of:

(a) determining whether a voice message reproduce mode is set by a user;

(b) accessing the memory to find the last stored voice message by consulting stored times of respective voice messages, when the voice message reproduce mode is set;

(c) reproducing the found voice message while simultaneously displaying a remaining time left in the found voice message;

(d) after a predetermined time interval, updating the remaining time being displayed;

(e) determining whether a scroll key is input; and

(f) finding a next voice message and returning to step (c) to reproduce the next voice message, if the scroll key is input.

6. The method as claimed in claim 5, wherein the remaining time is displayed on a count-down basis.

7. The method as claimed in claim 5, further comprising the steps of:

(g) upon failure to detect the scroll key input, determining whether reproducing is completed;

(h) upon completion of reproducing, determining whether the user intends to listen to the voice message again;

(i) returning to step (c) if the user intends to listen to the voice message

again, and if not, determining whether the reproduced voice message is a last voice message;

(j) ending the reproducing operation if the reproduced voice message is the last voice message; and

(k) finding a next voice message and returning to step (c) to reproduce the next voice message, if the reproduced voice message is not the last voice message.

Searched Indexed

## ABSTRACT

A method for managing voice messages in a mobile telephone, including a voice message store mode and a voice message reproduce mode. In the voice message store mode, the remaining memory capacity is calculated first, and, if there is sufficient memory, the voice message begins to be stored while the length of the currently storing voice message is displayed. At predetermined time intervals, the remaining memory capacity is calculated again and the displayed length is updated. If it is determined that there is insufficient memory capacity, a memory full message is displayed. When the voice message is completely stored, storage-related information is calculated and stored with the voice message. In the voice reproduce mode, the last stored message is found and then reproduced while the time remaining in the stored message is displayed. The time remaining is updated at predetermined time intervals. If scroll key input is detected, the next-to-last previous voice message is found and reproduced. When the reproduction is complete, the user may choose to listen to it again or listen to the next-to-last or next previous voice message.

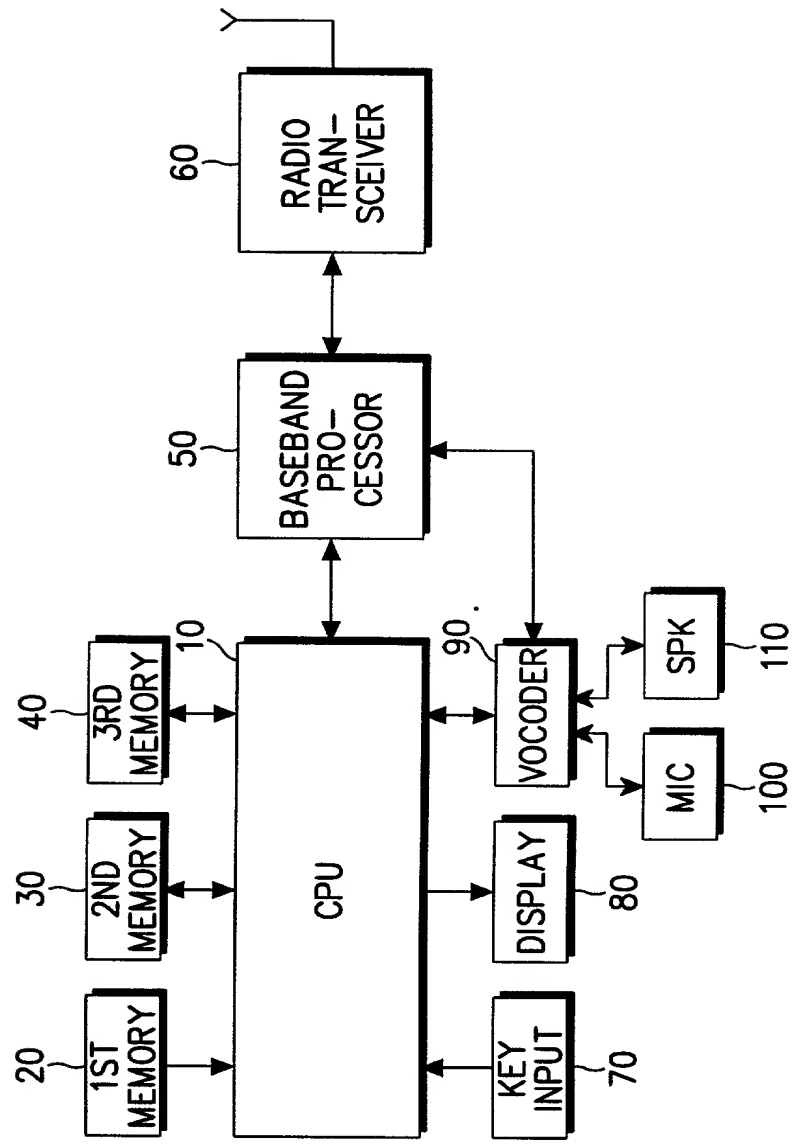
RADIO TRAN- SCEIVER
60
BASEBAND PRO- CESSOR
50
3RD MEMORY
40
2ND MEMORY
30
1ST MEMORY
20
CPU
10
VOCODER
90
SPK
110
MIC
100
DISPLAY
80
KEY INPUT
70

FIG. 1

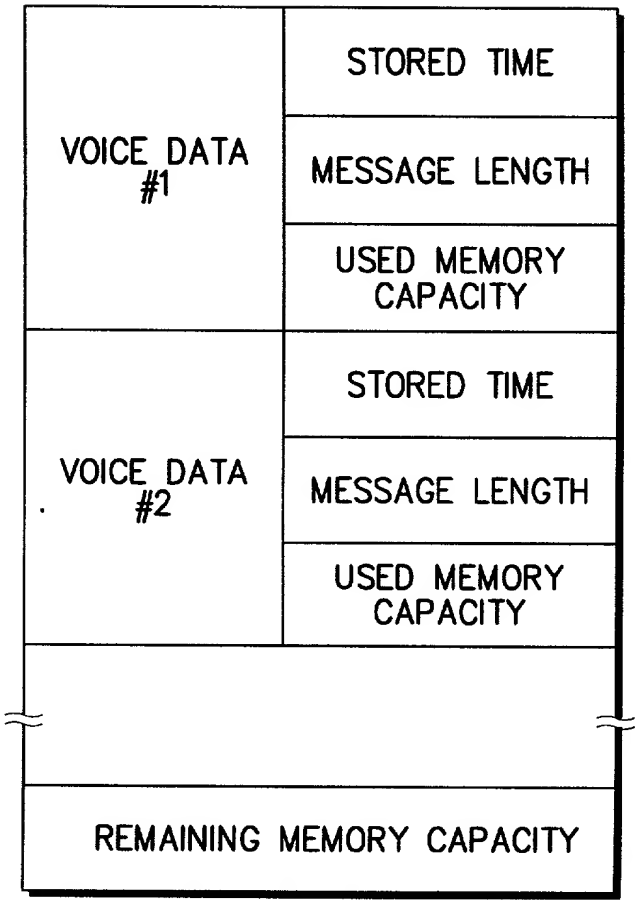
VOICE DATA #1
STORED TIME
MESSAGE LENGTH
USED MEMORY CAPACITY
VOICE DATA #2
STORED TIME
MESSAGE LENGTH
USED MEMORY CAPACITY
REMAINING MEMORY CAPACITY

FIG. 2

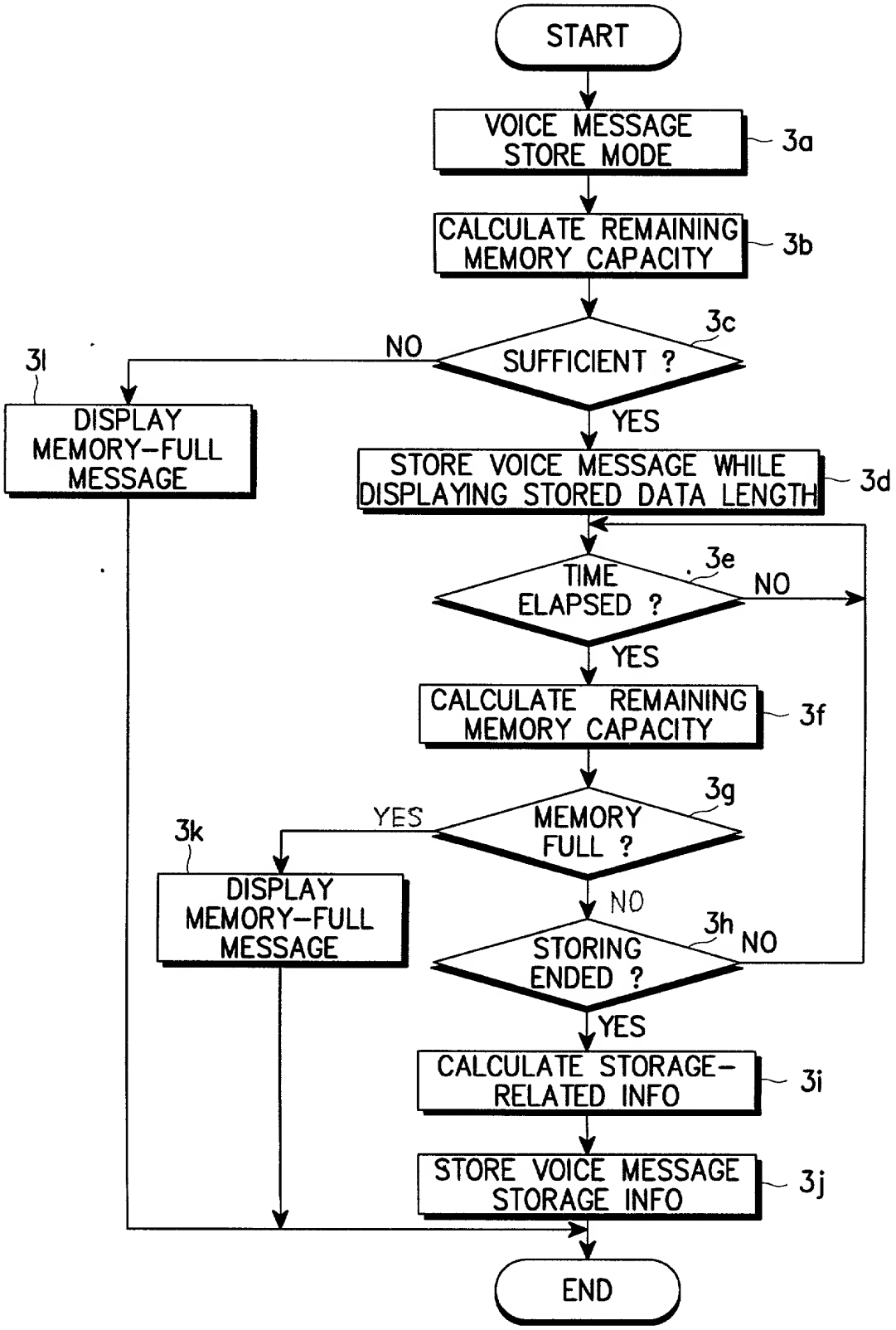
START
VOICE MESSAGE STORE MODE
3a
CALCULATE REMAINING MEMORY CAPACITY
3b
3c
SUFFICIENT ?
NO
3l
DISPLAY MEMORY-FULL MESSAGE
YES
STORE VOICE MESSAGE WHILE DISPLAYING STORED DATA LENGTH
3d
3e
TIME ELAPSED ?
NO
YES
CALCULATE REMAINING MEMORY CAPACITY
3f
3g
MEMORY FULL ?
YES
3k
DISPLAY MEMORY-FULL MESSAGE
NO
3h
STORING ENDED ?
NO
YES
CALCULATE STORAGE-RELATED INFO
3i
STORE VOICE MESSAGE STORAGE INFO
3j
END

FIG. 3

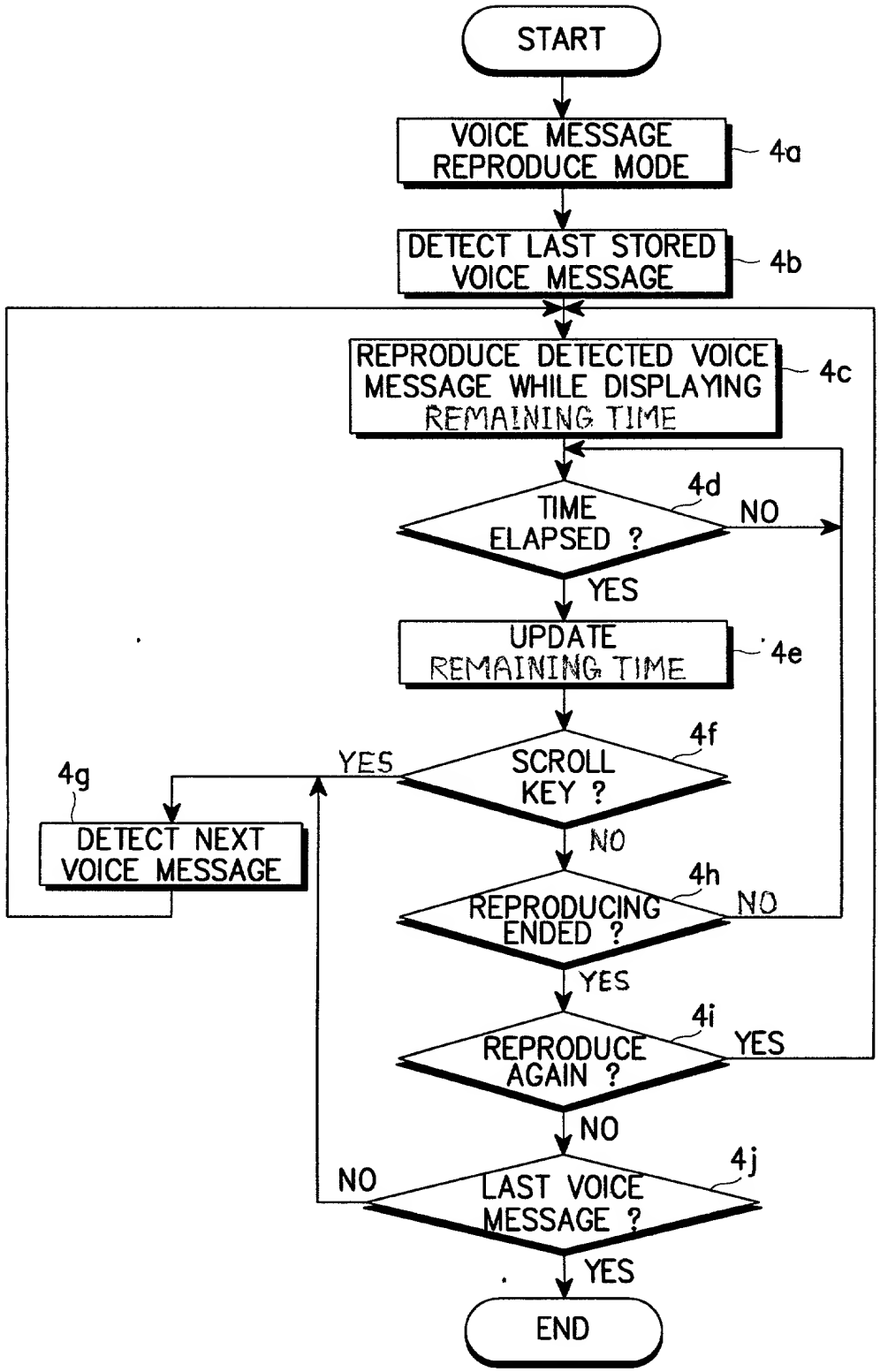
START
VOICE MESSAGE REPRODUCE MODE
4a
DETECT LAST STORED VOICE MESSAGE
4b
REPRODUCE DETECTED VOICE MESSAGE WHILE DISPLAYING REMAINING TIME
4c
TIME ELAPSED ?
4d
NO
YES
UPDATE REMAINING TIME
4e
SCROLL KEY ?
4f
YES
4g
DETECT NEXT VOICE MESSAGE
NO
REPRODUCING ENDED ?
4h
NO
YES
REPRODUCE AGAIN ?
4i
YES
NO
LAST VOICE MESSAGE ?
4j
NO
YES
END

FIG. 4